

REMARKS

Reconsideration and withdrawal of the rejections of the claimed invention is respectfully requested in view of the amendments, remarks and enclosures herewith, which place the application in condition for allowance.

I. STATUS OF CLAIMS AND FORMAL MATTERS

Claims 1, 2, 10-15, 18 and 19 ("aluminum oxide catalyst" claims) have been cancelled. Claims 5, 16 and 17 have been amended. Claims 4-9, 16 and 17 are now pending in this application upon entry of the amendment. The amendment to claim 5 is essentially the introduction of the limitations with regard to the catalyst which were present in claim 1, which is now cancelled. In addition, claim 5 has been amended to include the limitation "wherein no additional metallic components are present in said aluminum oxide catalyst" which is supported at least by the recitation on page 7, lines 20-24 of the specification.

No new matter has been added by this amendment.

It is submitted that the claims, herewith and as originally presented, are patentably distinct over the prior art cited in the Office Action, and that these claims were in full compliance with the requirements of 35 U.S.C. § 112. The amendments of the claims, as presented herein, are not made for purposes of patentability within the meaning of 35 U.S.C. §§§§ 101, 102, 103 or 112. Rather, these amendments and additions are made simply for clarification and to round out the scope of protection to which Applicants are entitled.

II. CLAIM OBJECTIONS HAVE BEEN OVERCOME

With the above claim amendments, claims 5, 16 and 17 recited a limitation which includes diammoniumhydrophosphate and/or ammoniumdihydrophosphate and the typographical error in the formula has been corrected.

III. THE 35 U.S.C. 102(b) REJECTION HAS BEEN OVERCOME

Claims 1, 2, 10-15 and 19 were rejected as allegedly being anticipated by Sato et al. (U.S. Patent No. 4,791,084 - "Sato"). The applicants request reconsideration of this rejection for the following reasons.

In order to advance prosecution, all of the claims directed to the aluminum oxide catalyst (claims 1, 2, 10-15 and 19) have been cancelled. The only remaining claims (claims 4-9, 16 and 17) are directed toward the method of catalytic decomposition which were not rejected as being anticipated and therefore this rejection can be withdrawn.

IV. THE 35 U.S.C. 103(a) REJECTION HAS BEEN OVERCOME

Claims 4-9 and 16-18 were rejected as allegedly being obvious by Rossin (U.S. Patent No. 6,509,511) in view of Sato et al. (U.S. Patent No. 4,791,084 - "Sato"). The applicants request reconsideration of this rejection for the following reasons.

Claims 4-9 and 16-18 had been rejected on the ground that Rossin taught a process for the decomposition of perfluoroalkanes via contact thereof with a catalyst comprising alumina and the catalyst preferably comprises a stabilizing agent (in amounts ranging from 1 to 100 parts by weight per 100 parts alumina), examples of which include phosphorus and that the differences between Rossin and the applicants' claimed process were rendered obvious when also considering Sato. The applicants will first address the difference between Rossin and the claimed process as amended and then address why the combination of Rossin and Sato do not render the claimed process as amended to be obvious.

Difference between Rossin and claimed process as amended

The phosphorous component of the presently claimed invention as amended is characterized in being selected from the group consisting of diammoniumhydrophosphate $((\text{NH}_4)_2\text{HPO}_4)$, ammoniumdihydrophosphate $((\text{NH}_4)\text{H}_2\text{PO}_4)$ and phosphoric acid (H_3PO_4) , i.e. the phosphorous component of the present invention does not contain any metal.

On the contrary, Rossin discloses that the alumina is prepared from aluminum nitrate. Also, Rossin enumerates very broadly the kinds of the stabilizing agent which can be added in the aluminum oxide, such as barium, calcium, phosphorus, cerium, chromium, cobalt, iron, lanthanum, magnesium, nickel, tin, titanium, and zirconium. Rossin also discloses that the stabilizing agent may be present as the metal or as one or more compounds thereof, such as an oxide, and also discloses that the preferred stabilizing agents are zirconium oxide and cobalt.

The examples in Rossin discloses aluminum oxide loaded with a second metal component such as ZrO_2 -aluminum oxide and Co-aluminum oxide. However, Rossin never teach nor suggest the aluminum oxide catalyst loaded with only phosphorous without metal. Furthermore, Rossin never teaches or suggests the fact that the phosphorous component is selected from the group consisting of diammoniumhydrophosphate $((\text{NH}_4)_2\text{HPO}_4)$, ammoniumdihydrophosphate $((\text{NH}_4)\text{H}_2\text{PO}_4)$ and phosphoric acid (H_3PO_4) and therefore, the phosphorous component does not contain any metal, as the present invention.

That is, Rossin discloses that aluminum oxide catalyst loaded with stabilizing agent which may be metal or metal oxide does not significantly affect the activity of the alumina, but significantly increases the active life of the catalyst in the conversion of perfluoroalkanes, but it does not teach nor suggest the aluminum oxide catalyst loaded with only phosphorous component without metal. Therefore, Rossin cannot be regarded as disclosing the aluminum oxide catalyst loaded with phosphorous component as presently claimed.

Moreover, Rossin never teaches nor suggests that the phosphorous component is selected from the group consisting of diammoniumhydrophosphate $((\text{NH}_4)_2\text{HPO}_4)$, ammoniumdihydrophosphate $((\text{NH}_4)\text{H}_2\text{PO}_4)$ and phosphoric acid (H_3PO_4) , and thereby does not contain any metal, as the amended claims of the present application.

Furthermore, Rossin never teaches or suggests that the aluminum oxide is formed from an aluminum precursor selected from the group consisting of Al_2O_3 , $\text{Al}(\text{OH})_3$, gamma alumina, boehmite and pseudo-boehmite, while it discloses that the alumina is prepared from aluminum nitrate.

The aluminum oxide catalyst which is loaded by only phosphorous component and does not contain any metal therein as the claimed invention has the surface of AlPO_4 structure, whereas the aluminum oxide catalyst which is loaded by metal component as Rossin has the surface of MAl_2O_4 (where, M is metal). Therefore, the catalyzing activities are totally different between the catalysts of the two inventions.

The characteristic structure of the catalyst for catalytic decomposition of exhausted perfluoro-compounds of the present invention is developed by the inventors of the present invention for the first time, and never taught nor suggested in the prior art including Rossin.

Therefore, the catalyst used in the process of Rossin is clearly different than that used in the applicants' claimed process. The rejection of record is the combination of Rossine
Combination of Rossin and Sato does not render claimed invention as amended to be obvious

In the final rejection, it was alleged that it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the teachings of Rossin by substituting the catalyst disclosed therein with the catalyst disclosed in Sato et al., and thereby obtain applicants claimed invention.

However, Sato relates to a cracking catalyst for hydrocarbons with superior selectivity to gasoline production and greater metals tolerance comprising a porous inorganic oxide matrix

composited with a crystalline aluminosilicate zeolite and a phosphorous-containing alumina in the form of small lumps.

At the time the present invention was made, the object of developing the alumina catalyst containing phosphorous was to enhance the metals tolerance of the catalyst against the transition metals such as Ni, V, Fe which are contained in the reactants in process of cracking of hydrocarbons and to increase the selectivity of gasoline among the products. Also, the phosphorous containing alumina is not a main component but a mere additive for aiding the main component of crystalline aluminosilicate zeolite.

On the contrary, Rossin relates to a process for the decomposition of perfluoroalkanes comprising contacting a gaseous stream comprising the perfluoroalkanes with a catalyst comprising alumina. One of ordinary skill in the art would not have looked to the technology of Sato which is directed toward a completely different process for improvements to the process of Rossin, i.e. cracking of hydrocarbons vs. conversion of perfluoroalkenes does not lend itself to predictable results when substituting an element from one process into the other process. Even if the references had been in the same technology, there was no reason even under an obvious to try standard of reasoning to select the particular element of Sato for combination with Rossin, i.e. there were numerous elements which could have been selected from within Sato each of which would not have given a predictable result when combined with Rossin.

Therefore, one of ordinary skill in the art would not have found the substitution of the catalyst disclosed in Sato with the catalyst disclosed in Rossin as there is no direction from the references as a whole or in the state of the art to do so.

V. PARALLEL KOREAN APPLICATION HAS BEEN ALLOWED

Although the applicants realize that decisions of patentability in other countries are not binding on the USPTO, the findings in other countries can be considered by the Office. The applicants note that the parallel Korean application of the present application had been considered patentable due to reasons which have substantially been given above and has been granted as KR 10-0461758.

During the Intellectual Property Organization's "PTO Day" on 3 December 2007, Mr. Pinchus Laufer of the USPTO's Office of Patent Legal Administration (OPLA), mentioned that the PTO is planning to extend the Patent Prosecution Highway to include pilot programs with

Korea and Canada in FY-2008 (Currently, Japan and the United Kingdom are running pilot programs with the USPTO).

CONCLUSION

In view of the remarks and amendments herewith, the application is believed to be in condition for allowance. Favorable reconsideration of the application and prompt issuance of a Notice of Allowance are earnestly solicited. The undersigned looks forward to hearing favorably from the Examiner at an early date, and, the Examiner is invited to telephonically contact the undersigned to advance prosecution. The Commission is authorized to charge any fee occasioned by this paper, or credit any overpayment of such fees, to Deposit Account No. 50-0320.

Respectfully submitted,
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